LAWRENCE LIVERMORE
REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory, Sept. 20-24, 2010

LLNL wants you

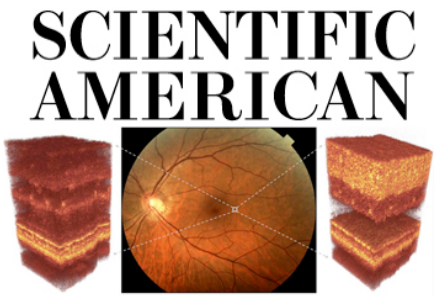
The Lab plans to hire 300 people by the end of the year in the fields of engineering, computing, chemistry, physics and others.

Some of the jobs are in the National Ignition Facility, where scientists will attempt to create fusion energy in the laboratory. Fusion energy is the same energy found in the sun and stars. NIF will begin experiments later this year.

Other jobs will be in national security, including high-performance computing -- the Lab has long been a center for supercomputer work. Supercomputers also are being used to study how to defend U.S. networks against terrorist strikes, and the Lab will be hiring for that work, as well.

KGO radio recently interviewed LLNL's Strategic Human Resources Management's Art Wong. To listen to the interview, go here.

Peering into damaged eyes



Using the same adaptive optics principles that let astronomers see distant objects with such instruments as the Keck Telescope, researchers have created a new device for ophthalmologists to see the eye's retina at the individual cell level.

Researchers at LLNL, the Indiana University School of Optometry, Boston Micromachines and the University of California, Davis, built three of these adaptive optics – optical coherence tomography (AO-OCT) systems, with help from the National Eye Institute.

"There is a whole history of attempts to image the retina in a way that would help doctors diagnose blinding diseases earlier," says LLNL physicist Scot Olivier, who is leading the LLNL work. OCT can make noninvasive, in vivo measurements of the thickness of specific retinal layers, such as the nerve fiber layer, which thins in patients with glaucoma.

Most ophthalmologists already use OCT to measure nerve fiber thickness, Olivier says. If a company could commercialize the adaptive optics as an add-on to OCT, imagine a new generation of devices allowing volumetric retinal imaging with high sensitivity.

To read more, go to the Web.

Radiation is crystal clear

Laboratory scientists, in partnership with Fisk University, have developed a new type of radiation-detecting crystal that is not only more accurate than most of the devices on the market, but also cheaper and easier to make.

The radiation detectors currently in use at U.S. ports and border crossings can be a bit hazy when it comes to narrowing down the source of a radiation signature and figuring out whether it's a threat or benign.

That's where the new detector comes in. The radiation signature is crystal clear.

In November, Lab researchers and their partners at Fisk University, Oak Ridge National Laboratories, Radiation Monitoring Devices Inc. and the Department of Homeland Security will be honored with an R&D 100 award, given to the 100 most clever inventions of the year.

The new detector -- or "high-performance strontium iodide scintillator for gamma-ray spectroscopy" -- could go into production next year.

To read more, go to the Web.

It's big, it's clean, it's the future

When it comes to future sources of green energy, look no further than LLNL's National Ignition Facility.

The real hope for the future is fusion energy. And NIF is the only project that is closing in on achieving it.

According to KGO Radio host Bill Wattenburg there's nothing in the world operating like it and no research closer to achieving that holy grail called ignition in which hydrogen nuclei fuse together and create the same energy that powers the sun.

Wattenburg goes on to say that NIF is the Apollo program of the 20th century.

To hear the full interview, go here.

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LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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